Operations & Maintenance Guidelines for Manure Storage Structures

Landowner: Walnutdale Dairy

Manure storage pits are designed to contain all of the manure, bedding, and water that are generated by cattle and management at the Walnutdale facility. Care should be exercised so that foreign objects or frozen material are excluded from the facility. It is wise to dedicate a portion of the silage pad, or other area where frozen materials can be stacked until they thaw and can be added to the storage facility.

Excessive bedding can cause management problems with a liquid storage facility. Granular materials such as limestone and sand will settle tot eh bottom and can cause problems with agitation processes and with equipment.

Manure storage ponds experience some biological activity and can generate some undesirable odors. This can be minimized if a crust forms on the surface. Some crusts naturally form, and others can be encouraged by blowing chopped straw or bedding on the surface.

Adequate time needs to be allocated for emptying the storage pond. A marking post should be placed in the pond indicating what percentage of the facilities storage capacity has been used. Freeboard markers have been installed in all structures to reflect the minimum required freeboard and are marked at one foot increments below that point.

The capacities of the liquid storage structures at the Walnutdale facility are listed in the chart below.

Walnutdale Dairy Liquid Manure Storage

Storage ID	Usable Volume (gallons)	Usable Volume (cu-ft)	Estimated production (gallons)	Storage Time (days)
Pit 1	76,820	10,270	1,918,170	14.6
Pit 2	76,820	10,270	3,963,836	7.1
Slurry Store	878,818	117,489	2,579,637	124.3
Pit 6	57,977	7,751	1,293,875	16.4
Pit 7	95,063	12,709	3,356,537	10.3
Pit 8 Storage	4,969,308	664,346	1,216,033	1,491.6
Catch Basin	2,928,555	391,518	4,354,856	245.5
Farm Total:	**9,083,360**	**1,214,353**	**18,682,944**	**177.5**

Prior to emptying the manure storage structures, they should be agitated for at least one day. Additional agitation may be needed during the emptying process.

To empty the manure storage facilities when they are at their usable capacity, using a 7,000 gallon tanker, at 5 loads/hour, the following chart shows total loads and time required to empty the structures.

Walnutdale Dairy Manure Storage & Hauling data

Storage ID	Usable Volume (gallons)	Usable Volume (cu-ft)	Estimated production (gallons)	Storage Time (days)	7,000 gallon Loads	Hours to empty facility	
Pit 1	76,820	10,270	1,918,170	14.6	11.0	2.2	hours
Pit 2	76,820	10,270	3,963,836	7.1	11.0	2.2	hours
Slurry Store	878,818	117,489	2,579,637	124.3	125.5	25.1	hours
Pit 6	57,977	7,751	1,293,875	16.4	8.3	1.7	hours
Pit 7	95,063	12,709	3,356,537	10.3	13.6	2.7	hours
Pit 8 Storage	4,969,308	664,346	1,216,033	1,491.6	709.9	142.0	hours
Catch Basin	2,928,555	391,518	4,354,856	245.5	418.4	83.7	hours
Farm Total:	**9,083,360**	**1,214,353**	**18,682,944**	**177.5**			

Ground conditions need to be evaluated prior to applying the waste. Excessively wet conditions or excessively dry conditions should be avoided, since waste may either run off or flow through cracks to subsurface drainage systems. Wind conditions should be observed to avoid drift and odor problems. Subsurface outlets and downstream drainage should be constantly monitored.

Maximum application rates should consider the intake capability of particular soils that waste is applied on. Please review the CNMP for application rates and dates.